27969 yuan), and high (urban: 36552 to 94297 yuan; rural: 28464 to 93043 yuan).
We used the PROC SURVEYFREQ procedure (SAS 9.2; SAS Institute, Cary, NC, USA) to calculate the overall and sex-specific prevalence of knee SxOA according to strata of each risk factor among all the participants. We used the PROC SURVEYLOGISTIC procedure (SAS 9.2) to examine the association of each risk factor with the prevalence of knee SxOA adjusting for other potential confounders (gender, age, education, GDP per capita, urban/rural residents and regions). Both procedures took into account the complex survey design and non-response rate of CHARLS survey in both estimates and the corresponding standard errors (S.E).
Results: Included in this analysis were 17128 (96.7%) participants (mean age: 59.8 years, women: 51.6%) who had completed data on knee SxOA. As shown in Table 1, prevalence of knee SxOA was higher in women than that in men, with adjusted odds ratio (OR) = 1.76, 95% confidence interval (CI): 1.52-2.03. Knee SxOA prevalence increased with age until 70 years old then levelled off (P for trend < 0.01). Subjects who received middle/high school or college education had lower prevalence of knee SxOA than those who received no formal or only elementary school education (P<0.01). Participants who lived in the rural areas had higher prevalence of knee SxOA than those lived in the urban areas (OR=1.63, 95% CI: 1.28-2.09). Participants living in more developed areas had much lower prevalence of knee SxOA (5.1%) than those living in less developed areas (11.7%) (P<0.01). As shown in Figure 1 and Table 1, there was a difference in prevalence of knee SxOA according to geographic location (P<0.01): participants in the North and East regions had the lowest prevalence of knee SxOA, followed by those in the North-East (7.0%), South-Central (7.8%) and the North-West (10.8%) regions. Participants in the South-West region had the highest prevalence of SxOA (13.7%).
Conclusions: Prevalence of knee SxOA was higher in women than that in men and increased with age until 70 years old. Subjects living in rural areas, receiving less education, and having low income had higher prevalence of knee SxOA than their counterparts. There was a wide geographical variation in prevalence of knee SxOA, with participants in the west regions having much higher prevalence of knee SxOA than those living in east regions of China. Future studies are needed to identify the potential risk factors for such regional variation in prevalence of knee SxOA.

Table 1. Prevalence of symptomatic knee OA and adjusted OR

	Men(%)	Women(%)	Total(%)	Multivariable adjusted OR (95% CI)
Total	5.7	10.3	8.1	–
Age (year)				
<50	3.3	6.8	5.2	1.0 (reference)
50–59	5.7	9.1	7.4	1.38(1.13–1.69)
60–69	7.5	14.7	11.1	1.90(1.52–2.39)
≥ 70	5.9	11.5	8.8	1.42(1.12–1.81)
P for trend	–	–	–	<0.01
Education				
No formal education	9.9	12.2	11.7	1.0 (reference)
Elementary school	7.1	11.6	9.2	0.96(0.80–1.14)
Middle/High school	3.5	6.5	4.7	0.57(0.47–0.69)
College and over	0.8	1.6	1.1	0.15(0.07–0.35)
P for trend	–	–	–	<0.01
GDP per capita				
Low	8.8	14.3	11.7	1.0 (reference)
Middle	6.4	11.1	8.8	0.91(0.72–1.15)
High	3.1	7.0	5.1	0.61(0.46–0.79)
P for trend	–	–	–	<0.01
Locality				
Urban	2.9	7.2	5.2	1.0 (reference)
Rural	8.3	13.5	10.9	1.63(1.28–2.09)
P value	–	–	–	<0.01
Regions				
North	3.8	7.3	5.4	1.0 (reference)
East	4.0	7.0	5.5	0.88(0.64–1.21)
North-East	4.2	9.8	7.0	1.24(0.80–1.94)
South-Central	5.3	10.3	7.8	1.21(0.87–1.68)
North-West	8,1	13.5	10.8	1.62(1.06–2.49)
South-West	10.1	17.4	13.7	1.83(1.32–2.56)
P value	-	-	-	<0.01

Fig.1 Prevalence of symptomatic knee OA in different regions of China

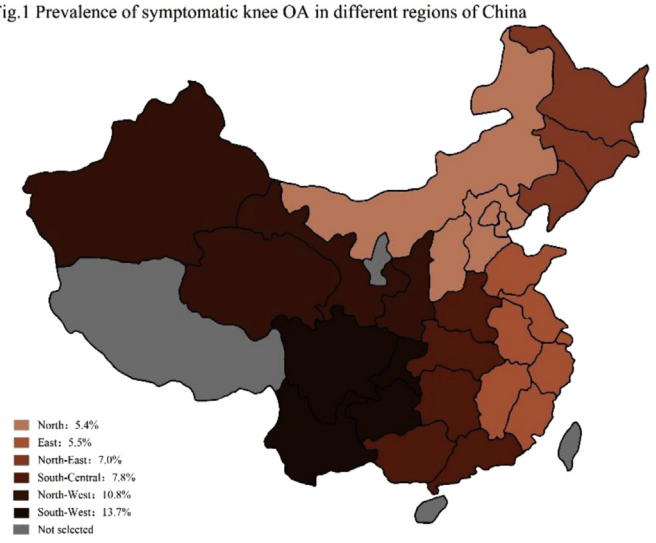

Fig.1. Prevalence of symptomatic knee OA in different regions of China.

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KNEE SYMPTOMATIC OSTEOARTHRITIS, WALKING DISABILITY AND ALL-CAUSE MORTALITY IN THE POPULATION-BASED LONGITUDINAL WUCHUAN OSTEOARTHRITIS STUDY

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Purpose: Several studies have reported that knee symptomatic osteoarthritis (SxOA) increases the risk of all-cause mortality. While the underlying biological mechanisms linking knee SxOA to high mortality are not fully understood, it has been postulated that walking disability from knee SxOA may partially account for such an association. To date no study has quantitatively evaluated to what extent an increased mortality among individuals with knee SxOA is mediated through walking disability.
Methods: Between 8/2005-10/2005, 1025 residents aged ≥ 50 years were recruited in randomly selected rural communities in Wuchuan, China. Participants completed a home interview and had weight-bearing posteroanterior semiflexed view of radiographs at tibiofemoral (TF) joints and skyline view of radiographs at patellofemoral (PF) joints. During the home-interview participants were asked if they could perform several daily activities, including current ability of walking for 1 kilometer with no-difficulty, some difficulty, and very difficult/unable to do. We defined a knee as having whole ROA if either K/L score at TF joint ≥ 2 or presence of PFOA based on OARSI criteria. Knee SxOA was recorded if both pain (i.e., knee pain occurred on most days in past month) and whole ROA were present at the same knee. Subjects were followed until November 31, 2013. First, we examined the relation of knee SxOA to the risk of all-cause mortality using the Cox-proportional hazards model adjusting for age, sex, body mass index (BMI), education levels, income levels, history of occupational physical activity, and comorbidities. We then partitioned the total effect of knee SxOA on mortality into indirect, i.e., an effect of SxOA on mortality via current ability of walking for 1 kilometer, and direct effect, i.e., an effect of SxOA not through current ability of walking for 1 kilometer using a marginal structural model.
Results: Over 8 years of follow-up period, 99 subjects died. As shown in Table 1, the mortality rates were higher among subjects with knee SxOA (32.6/1000 person-years) than those without SxOA (10.9/1000 person-years), with an adjusted hazard ratio of 1.98 (95% confidence interval: (CI): 1.09-3.62). The indirect effect of knee SxOA on mortality was 1.92 (95% CI: 0.86-4.26) whereas the direct effect was 1.08 (95% CI: 0.55-2.12), suggesting that effect of knee SxOA on all-cause mortality was almost entirely mediated through its effect on current ability of walking in 1 kilometers.
Conclusions: In this population-based longitudinal study, we found that an increase in all-cause mortality among subjects with knee SxOA was mainly mediated through its effect on walking disability.

Table 1. Total, Direct and Indirect Effect of Knee SxOA on All-Cause Mortality Mediated Through its Effect on Walking Disability

SxOAStatus	Subjects	Total effectHR (95% CI)*	Indirect effectHR (95% CI)*	Direct effectHR (95% CI)*
No	63	1.0	1.0	1.0
Yes	960	1.98 (1.09, 3.62)	1.92 (0.86, 4.26)	1.08 (0.55, 2.12)

*Adjusting for age, sex, body mass index (BMI), education levels, income levels, levels of occupational physical activity, and comorbidities.

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DOES THE RATE OF KNEE OA PROGRESSION INCREASE WITH AGE? ARTICULAR CARTILAGE CHANGES OVER SEVEN YEARS IN MOST

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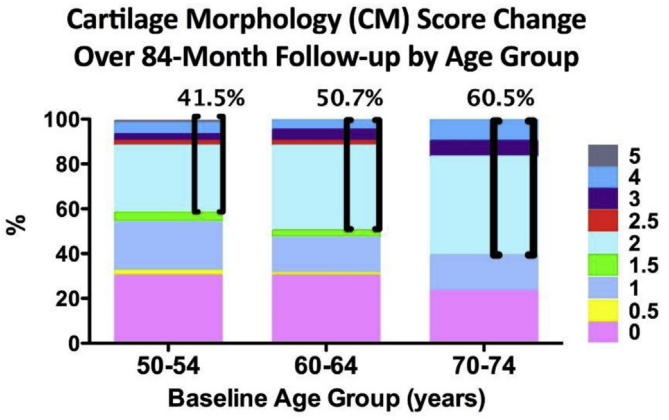
Purpose: The rate of knee osteoarthritis (OA) progression has been reported to vary from person to person. While knee OA prevalence is known to increase with age, it is unclear whether age influences the pace of OA progression. Therefore, we assessed whether cartilage morphology worsens at a greater rate with greater age.

Methods: The Multicenter Osteoarthritis Study (MOST) is a longitudinal cohort study of factors that may influence incidence or progression of knee OA. Participants eligible for this analysis underwent baseline, 60- and 84-month follow-up knee MRI scans and had Whole Organ MRI Scores (WORMS) for cartilage morphology (CM) scores (0-6) <6 in at least one knee subregion at baseline. Participants were stratified by baseline age into 3 categories: 50-54, 60-64 or 70-74 years old. Generalized estimating equations were used to determine whether the maximal change in CM score differed by age group while accounting for repeated measurements and baseline CM score. Sensitivity analyses were completed with the same methods using age and follow-up duration as continuous variables and data from all eligible participants (age 50-79 at baseline, n=949). The knee subregion with the maximal change in CM score from baseline to 84-month follow-up was utilized in analyses.

Results: A total of 569 (62.2% women, 88% White) out of 3026 MOST participants met inclusion criteria. Baseline characteristics are presented in Table 1. A greater proportion of knees demonstrated a worsening of CM score by ≥2 levels in the 70-74 year-old age group (60.5%) compared with in the 50-54 year-old age group (41.5%, p<0.01), while the 60-64 year-old age group fell in between (50.7%) and did not differ in a statistically significant manner. The figure depicts the frequencies of each grade of severity of knee OA progression on the WORMS-CM scale over the 84-month follow-up period. There was a significantly greater absolute increase in CM score for age 70-74 versus 50-54 (p=0.01) but no difference between 60-64 and 50-54 (p=0.78). There was also a statistically significant interaction effect present between age group and duration of follow-up, such that the differences in CM score progression between age 70-74 and 50-54 increased with follow-up duration (p<0.05). When age was used as a continuous variable, we found a positive association between CM score progression and age (p=0.01) as well as a significant interaction effect between age and follow-up duration such that this positive association increased with follow-up duration (p=0.03).



Proportion with >2 grades of worsening differed by age group (χ^2=8.0, p<0.02)

Conclusions: Older participants (age 70-74) were more likely to experience cartilage loss and were more likely to show extensive loss than younger persons (age 50-54) and with time from baseline, this age effect increased. These findings provide evidence for a greater pace of knee OA worsening with older age.

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OVERWEIGHT OR OLDER INDIVIDUALS PARTICULARLY AFTER AN INJURY ARE AT RISK FOR ACCELERATED KNEE OSTEOARTHRITIS: DATA FROM THE OSTEOARTHRITIS INITIATIVE

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Purpose: Knee osteoarthritis (KOA) is typically a slowly progressive disorder; however, a subset of knees progress with dramatic rapidity (e.g. from normal appearance to end-stage disease within 4 years). We recently characterized individuals with accelerated KOA and found that greater age, higher body mass index, and new knee injuries were key

Baseline characteristics by age group

Age group	50–54	60–65	70–75
Knees (N)	246	209	114
Regions (N)	1320	1114	533
Age (mean ± SD years)	51.9 (1.4)	62.0 (1.4)	71.8 (1.4)
Race (N, % White)	201 (81.7%)	186 (89.0%)	108 (94.7%)
KL Grade <2 (N, %)	208 (84.6%)	169 (80.9%)	76 (66.7%)
KL Grade 2 (N, %)	26 (10.6%)	27 (12.9%)	18 (15.8%)
KL Grade 3 (N, %)	12 (4.9%)	13 (6.2%)	19 (16.7%)
KL Grade 4 (N, %)	0 (0.0%)	0 (0.0%)	1 (0.9%)
Baseline CM Score among region of maximal change over 84mo follow-up: 1 (N, %)	1023 (77.5%)	815 (73.2%)	374 (70.2%)
CM 2 (N, %)	78 (5.9%)	72 (6.5%)	26 (4.9%)
CM 2.5 (N, %)	7 (0.5%)	13 (1.2%)	3 (0.6%)
CM 3 (N, %)	175 (13.3%)	187 (16.8%)	113 (21.2%)
CM 4 (N, %)	4 (0.3%)	0 (0.0%)	3 (0.6%)
CM 5 (N, %)	33 (2.5%)	27 (2.4%)	14 (2.6%)